

NCSET Module 16: Burnup Credit for Criticality Safety Analysis of Commercial Spent Nuclear Fuel

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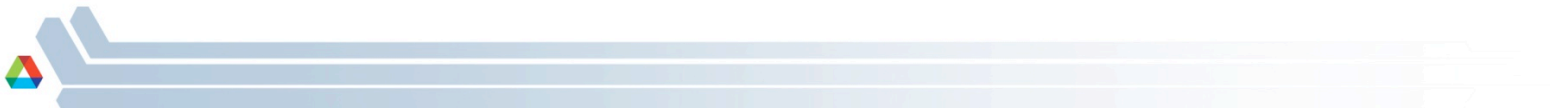
Oak Ridge National Laboratory

NCSET Module Development

Develop two additional Nuclear Criticality Safety Engineer Training (NCSET) modules that will be posted on the NCSP website as a training resource for the complex.

Target modules:

- Tutorial on the use of DICE to query the ICSBEP database
- Module on burnup credit for criticality safety
 - Start delayed due to new capabilities being added to DICE

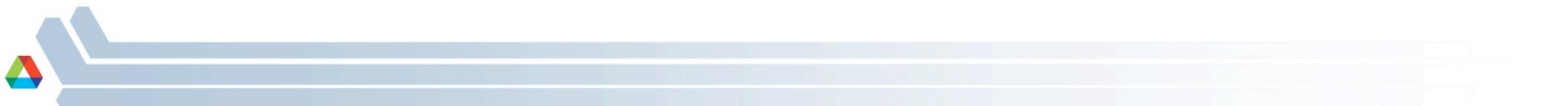




Progress - Burnup Credit Module

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- Contract set with Dale Lancaster
- Draft completed late September 2009
- Review comments provided by ORNL
- Currently waiting for final ORNL review

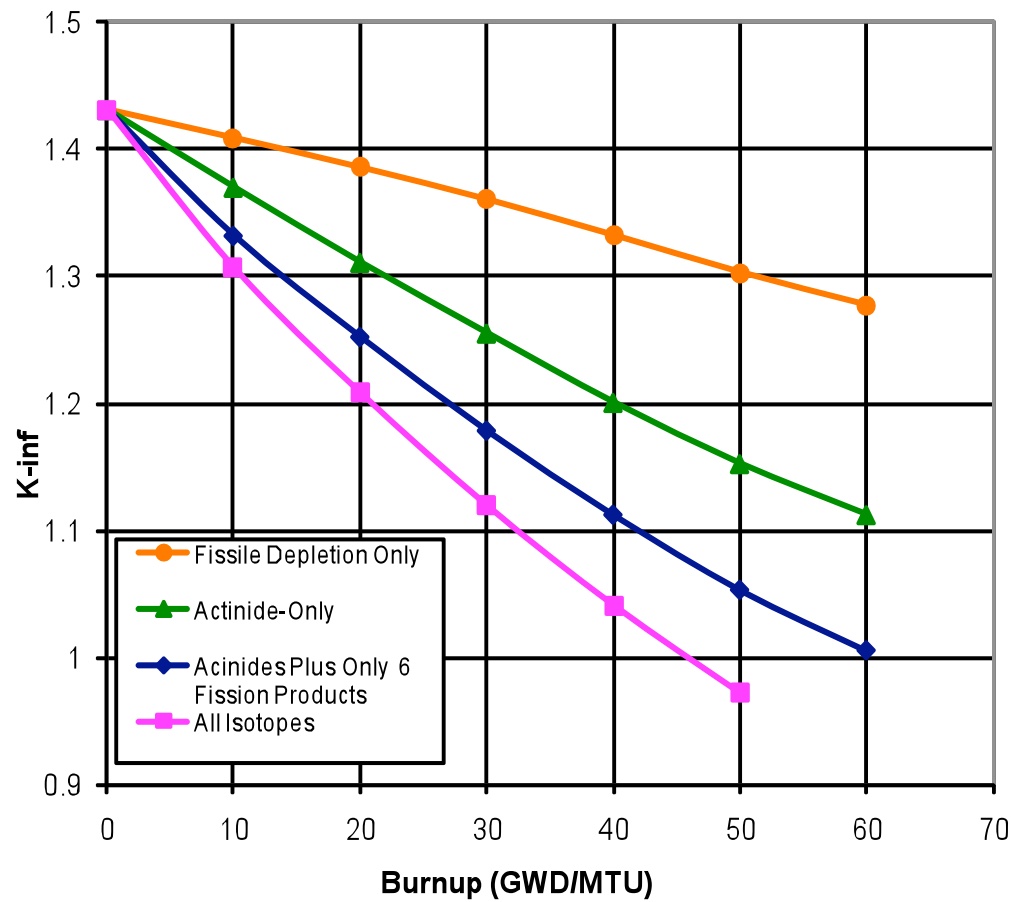


Burnup Credit Module

- This module introduces the reader to the concept of burnup credit and how to take credit for burnup in criticality safety analyses of irradiated commercial fuel.
- The subject of burnup credit is complex and a detailed treatment of all aspects of the subject is beyond the scope of this introductory module. The references provided herein provide a source for further reading and additional applications of burnup credit.
- Module addresses
 - Reactivity changes with burnup
 - Effect of burnup on k_{eff} as a function of enrichment
 - Burnup credit as a function of the number of isotopes credited
 - Effect of burnable absorbers
 - Effect of cooling time on burnup credit
 - Estimation of USL based on reactor and critical experiments data
 - Spatial effects in burnup credit
 - ...



Burnup Credit vs. Credited Isotopes



Burnup Credit vs. Cooling Time

